

**Claims**

1. (Original) An automatic test equipment (ATE) bidirectional drive channel for transmitting test signals to a device under test (DUT) and receiving signal from the DUT, comprising:

5 an input/output line for connection to a DUT,  
a driver circuit connected to apply test signals to said input/output line for application to a DUT,  
a receiver circuit connected to said input/output line to receive signals produced by a DUT, said receiver  
10 circuit having an associated capacitance, and  
a first passive matching network connected to said line to at least partially compensate for said receiver circuit capacitance.

2. (Previously Presented) The ATE drive channel of claim 1, said first passive matching network comprising a T-coil circuit.

3. (Currently Amended) The ATE drive channel of claim 2, wherein said driver and receiver circuits are implemented on a common layer of an integrated circuit (IC) to which said input/output line is connected, and said T-  
5 coil circuit includes inductors that are implemented in a separate layer of said IC that is spaced from said common layer by at least a dielectric layer, with electrical interconnects extending through said dielectric layer between said T-coil circuit and said IC.

4. (Currently Amended) The ATE drive channel of claim 3, further comprising a flip-chip bump having an associated redistribution layer at the same level as said T-coil inductors, with said redistribution layer connected to a metallization layer that also provides interconnects for said driver and receiver circuits, and connects said T-coil circuit to said driver and receiver circuits.

5. (Currently Amended) The An automatic test equipment (ATE) bidirectional drive channel of claim 1, for transmitting test signals to a device under test (DUT) and receiving signal from the DUT, comprising:

5 an input/output line for connection to a DUT,  
a driver circuit connected to apply test signals to said input/output line for application to a DUT,  
a receiver circuit connected to said input/output line to receive signals produced by a DUT, said receiver circuit having an associated capacitance, and  
a first passive matching network connected to said line to at least partially compensate for said receiver circuit capacitance,

10 said driver circuit comprising the combination of a current-mode driver having an associated capacitance and a voltage-mode driver, said receiver circuit comprising a comparator circuit for comparing a signal received from a DUT to a reference, further comprising a second passive matching network connected in series with said first passive matching network to at least partially compensate for said current-mode driver capacitance.

6. (Previously Presented) The ATE drive channel of claim 5, said first and second passive matching networks comprising respective T-coil circuits.

7. (Currently Amended) An automatic test equipment (ATE) receive channel for receiving signals from a device under test (DUT), comprising:

an output line for connection to a DUT,

5 at least one receiver circuit connected to said output line to receive signals produced by a DUT, said receiver circuit having an associated capacitance, and

10 a passive matching network connected to said line to at least partially compensate for said receiver capacitance.

8. (Previously Presented) The ATE receive channel of claim 7, said passive matching network comprising a T-coil circuit.

9. (Currently Amended) The ATE receive channel of claim 8, wherein said receiver circuit is implemented on one layer of an integrated circuit (IC), to which layer said output line is connected, and said T-coil circuit includes inductors that are implemented in a separate layer of said IC that is spaced from said first layer by at least a dielectric layer, with electrical interconnects extending through said dielectric layer between said T-coil circuit and said IC.

10. (Currently Amended) The ATE receive channel of claim 9, further comprising a flip-chip bump having an

associated redistribution layer at the same level as said T-coil inductors, with said redistribution layer connected to a metallization layer that also provides interconnects for said driver and receiver circuits, and connects said T-coil circuit to said driver and receiver circuits.

5 11-21. (Cancelled)

22. (Previously Presented) An automatic test equipment (ATE) bidirectional drive channel for transmitting test signals to a device under test (DUT) and receiving signals from the DUT, comprising:

5 an input/output line for connection to a DUT,  
a driver circuit connected to apply test signals to said input/output line for application to a DUT,  
a receiver circuit connected to said input/output line to receive signals produced by a DUT, said receiver  
10 circuit having an associated capacitance, and  
a first bidirectional passive matching network connected to said line to at least partially compensate for said receiver circuit capacitance.

23. (Previously Presented) The ATE drive channel of claim 22, said first bidirectional passive matching network comprising a T-coil circuit.

24. (Currently Amended) The ATE drive channel of claim 23, wherein said driver and receiver circuits are implemented on a common layer of an integrated circuit (IC) to which said input/output line is connected, and said T-  
5 coil circuit includes inductors that are implemented in a

separate layer on said IC that is spaced from said common layer by at least a dielectric layer, with electrical interconnects extending through said dielectric layer between said T-coil circuit and said IC.

25. (Currently Amended) The ATE drive channel of claim 24, further comprising a flip-chip bump having an associated redistribution layer at the same level as said T-coil inductors, with said redistribution layer connected to a metallization layer that also provides interconnects for said driver and receiver circuits, and connects said T-coil circuit to said driver and receiver circuits.

26. (Currently Amended) The An automatic test equipment (ATE) bidirectional drive channel of claim 22, for transmitting test signals to a device under test (DUT) and receiving signals from the DUT, comprising:

5 an input/output line for connection to a DUT,  
a driver circuit connected to apply test signals to said input/output line for application to a DUT,  
a receiver circuit connected to said input/output line to receive signals produced by a DUT, said receiver  
10 circuit having an associated capacitance, and  
a first bidirectional passive matching network connected to said line to at least partially compensate for said receiver circuit capacitance,

15 said driver circuit comprising the combination of a current-mode driver having an associated capacitance and a voltage-mode driver, said receiver circuit comprising a comparator circuit for comparing a signal received from a DUT to a reference, further comprising a second

20 bidirectional passive matching network connected in series with said first bidirectional passive matching network to at least partially compensate for said current-mode drive capacitance.

27. (Previously Presented) The ATE drive channel of claim 26, said first and second bidirectional passive matching networks comprising respective T-coil circuits.

28. (Previously Presented) An automatic test equipment (ATE) receive channel for receiving signals from a device under test (DUT), comprising:

an output line for connection to a DUT,

5 at least one receiver circuit connected to said output line to receive signals produced by a DUT, said receiver circuit having an associated capacitance, and

a passive bidirectional matching network connected to said line to at least partially compensate for 10 said receiver capacitance.

29. (Previously Presented) The ATE receive channel of claim 28, said bidirectional passive matching network comprising a T-coil circuit.

30. (Currently Amended) The ATE receive channel of claim 29, wherein said receiver circuit is implemented on one layer of an integrated circuit (IC), to which layer said input/output line is connected, and said T-coil 5 circuit includes inductors that are implemented in a separate layer of said IC that is spaced from said first layer by at least a dielectric layer, with electrical

interconnects extending through said dielectric layer  
between said T-coil circuit and said IC.

31. (Currently Amended) The ATE receive channel of claim 30, further comprising a flip-chip bump having an associated redistribution layer at the same level as said T-coil inductors, with said redistribution layer connected  
5 to a metallization layer that also provides interconnects  
for said driver and receiver circuits, and connects said T-  
coil circuit to said driver and receiver circuits.

32. (New) An automatic test equipment (ATE) bidirectional drive channel for transmitting test signals to a device under test (DUT) and receiving signal from the DUT, comprising:

5 an input/output line for connection to a DUT,  
a driver circuit connected to apply test signals to said input/output line for application to a DUT,  
a receiver circuit connected to said input/output line to receive signals produced by a DUT, said receiver  
10 circuit having an associated capacitance, and  
a first passive matching network connected to said input/output line to at least partially compensate for said receiver circuit capacitance, said matching network comprising a plurality of inductors with mutual inductive  
15 coupling.

33. (New) The ATE drive channel of claim 32, said first passive matching network comprising a T-coil circuit.

34. (New) An automatic test equipment (ATE) receive channel for receiving signals from a device under test (DUT), comprising:

an output line for connection to a DUT,

5 at least one receiver circuit connected to said output line to received signals produced by a DUT, said receiver circuit having an associated capacitance, and

10 a passive matching network connected to said output line to at least partially compensate for said receiver capacitance, said matching network comprising a plurality of inductors with mutual inductive coupling.

35. (New) The ATE receive channel of claim 34, said passive matching network comprising a T-coil circuit.

36. (New) An automatic test equipment (ATE) bidirectional drive channel for transmitting test signals to a device under test (DUT) and receiving signals from the DUT, comprising:

5 an input/output line for connection to a DUT,

a driver circuit connected to apply test signals to said input/output line for application to a DUT,

10 a receiver circuit connected to said input/output line to receive signals produced by a DUT, said receiver circuit having an associated capacitance, and

15 a first bidirectional passive matching network connected to said input/output line to at least partially compensate for said receiver circuit capacitance, said matching network comprising a plurality of inductors with mutual inductive coupling.

37. (New) The ATE drive channel of claim 36, said first bidirectional passive matching network comprising a T-coil circuit.

38. (New) An automatic test equipment (ATE) receive channel for receiving signals from a device under test (DUT), comprising:

an output line for connection to a DUT,

5 at least one receiver circuit connected to said output line to receive signals produced by a DUT, said receiver circuit having an associated capacitance, and

a passive bidirectional matching network connected to said output line to at least partially 10 compensate for said receiver capacitance, said matching network comprising a plurality of inductors with mutual inductive coupling.

39. (New) The ATE receive channel of claim 38, said bidirectional passive matching network comprising a T-coil circuit.